

Abstract:

Whole cell biosensors (WCBs) utilize an organism's natural ability to sense and respond to the environment. Through implementation of two different protein engineering methods, I seek to develop a WCB for the detection of important chemical signatures in the environment. I will re-engineer the ligand binding profile of proteins known to alter transcription of genes, and I will engineer signal transduction in proteins already known to bind relevant compounds. In both cases, detection of compounds of interest will lead to the production of a measurable fluorescent signal within the organism. These approaches will provide the groundwork for the development of novel chemical sensing technologies that provide a cheap and efficient alternative to traditional methods for detection of compounds.

Bio:

Randy Lacey obtained his PhD from the University of Tennessee-Knoxville in the Biochemistry, Cellular and Molecular Biology Department. He is interested in understanding and manipulating how organisms sense and respond to external stimuli. As a graduate student he examined the possible signaling role of the plant hormone ethylene in cyanobacteria. In doing so, he characterized the first known ethylene receptor outside of plants. As an IC Postdoctoral Fellow his research will focus on protein engineering for the detection of important chemical signatures in the environment via whole cell biosensors. These engineered organisms will allow for detection of important compounds in the environment.